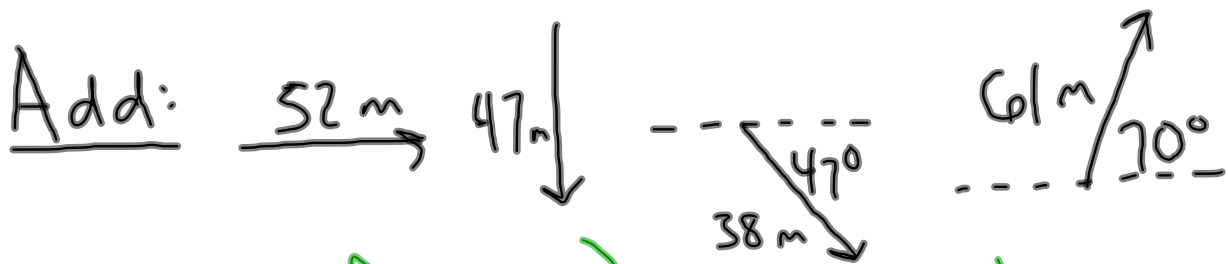
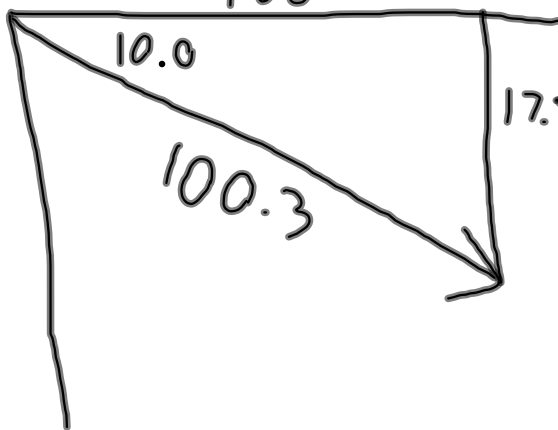


Quiz on Vectors tomorrow!

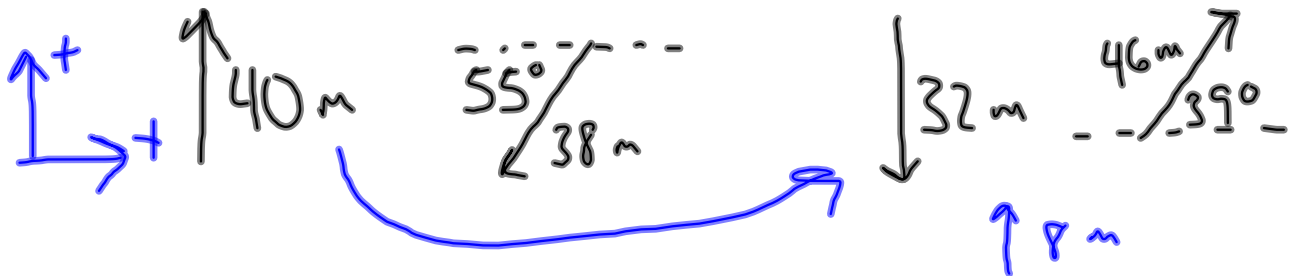


$$98.8 = 52 + (38 \cos(47)) + (61 \cos(70)) = A$$

$$-17.5 = -(47) - (38 \sin(47)) + (61 \sin(70)) = B$$



$$\vec{H} = 100.3\text{ m at } 10^\circ \text{ S of E}$$

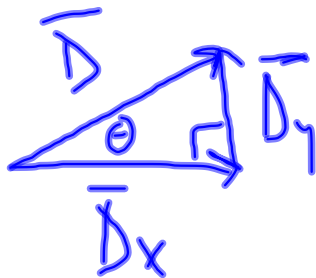


$$D_x = -(38 \text{ m}) \cos(55^\circ) + 0 \text{ m} + (46 \text{ m}) \cos(39^\circ)$$

$$= 14.0 \text{ m}$$

$$D_y = -(38 \text{ m}) \sin(55^\circ) + 8 \text{ m} + (46 \text{ m}) \sin(39^\circ)$$

$$= 5.82 \text{ m}$$



$$D = 15.1 \text{ m} \quad \text{N of E}$$

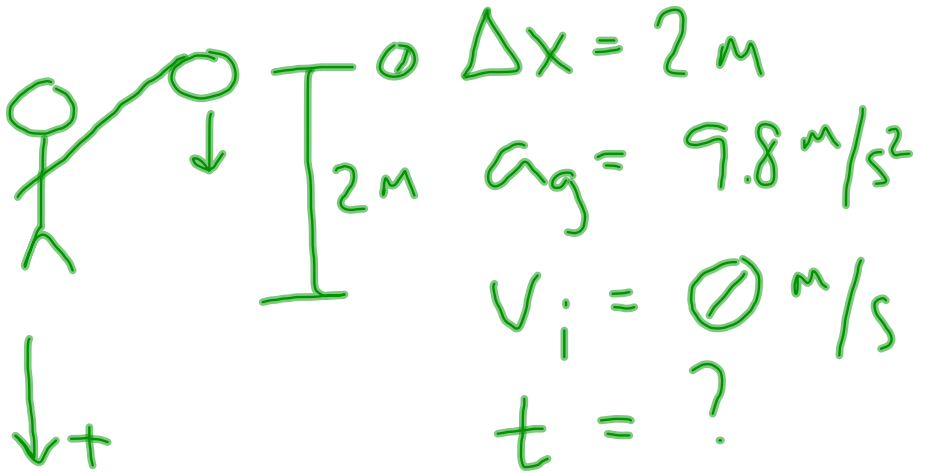
$$\theta = 22.6^\circ$$

$$\vec{D} = 15.1 \text{ m} @ 22.6^\circ \text{ N of E}$$

Free-fall:

- Only acceleration is due to gravity
- In the y -direction
- $a_g = g = 9.8 \text{ m/s}^2$

Jason drops a volleyball from 2.0 m above the floor. How long will it take before the ball hits the ground?



$$\Delta x = \cancel{v_i t} + \frac{1}{2} a_g t^2$$

$$\begin{aligned}
 t &= \sqrt{\frac{2 \Delta x}{a_g}} \\
 &= \sqrt{\frac{2(2 \text{ m})}{9.8 \text{ m/s}^2}} \\
 &= 0.64 \text{ s}
 \end{aligned}$$

Jason then hits the volleyball so that it moves with an initial velocity of 6.0 m/s straight up.

- What is the maximum height that the ball reaches?
- How long does it take to reach the maximum height?
- How long does it take for the ball to reach the floor?

A coin is tossed vertically upward.

- What happens to its velocity while it is in the air? Draw a position v. time graph and velocity v. time graph to verify.
- Does its acceleration increase, decrease, or remain constant while it is in the air?

A small first-aid kit is dropped by a rock climber who is descending steadily at 1.3 m/s. After 2.5 s, what is the velocity of the first-aid kit, and how far is the kit below the climber?